

CANCER THERAPEUTIC BASED ON T CELL RECEPTORS DESIGNED TO REGIOSPECIFICALLY RELEASE INTERLEUKIN-12

SUMMARY

The National Cancer Institute's Surgery Branch is seeking statements of capability or interest from parties interested in collaborative research to further develop, evaluate, or commercialize a potential cancer therapeutic based on T cells genetically engineered to express the human interleukin 12 (IL-12) cytokine only in the tumor environment.

REFERENCE NUMBER

E-170-2009

PRODUCT TYPE

- Therapeutics

KEYWORDS

- T cell receptor, TCRs
- Chimeric Antigen Receptor, CARs
- human interleukin 12, IL-12

COLLABORATION OPPORTUNITY

This invention is available for licensing and co-development.

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DESCRIPTION OF TECHNOLOGY

Adoptive immunotherapy is a promising new approach to cancer treatment that engineers an individual's innate and adaptive immune system to fight against specific diseases, including cancer with fewer side-effects and more specific anti-tumor activity in individual patients. T cell receptors (TCRs) and Chimeric Antigen Receptors (CARs) are proteins that recognize antigens in the context of infected or transformed cells and activate T cells to mediate an immune response to destroy abnormal cells. When a TCR/CAR is stimulated by an antigen, signaling pathways activated in the T cell lead to the production of proteins such as cytokines, which mediate the immune response and ultimately lead to the death of the diseased target cell.

Scientists at the National Cancer Institute (NCI) [Surgery Branch](#) have developed T cells genetically engineered to express the human interleukin 12 (IL-12) cytokine only in the tumor environment. Thus, IL-12 is only released at the cancer site and only after the activation of the T cell. This technology makes it possible to control the expression of IL-12 to enhance T cell cytolytic activity while also reducing or eliminating the IL-12 toxicity observed with other IL-12 related therapies. Infusing these IL-12 expressing T cells into patients via adoptive immunotherapy could prove to be powerful new tools for attacking tumors. Further R&D Needed: Testing of function at scale-up levels required for clinical trials.

POTENTIAL COMMERCIAL APPLICATIONS

- Immunotherapeutics to treat and/or prevent the recurrence of a variety of human cancers by adoptively transferring the gene-modified T cells into patients.
- Immunotherapeutics to treat and/or prevent the recurrence of a variety of human infectious agents by adoptively transferring the gene-modified T cells into patients.
- A drug component of a combination immunotherapy regimen aimed at targeting the specific tumor-associated antigens expressed by cancer cells within individual patients

COMPETITIVE ADVANTAGES

- The combination of enhanced T cell activity with reduced IL-12 toxicity: IL-12 has shown remarkable properties as an anti-tumor agent, but its clinical development has been hindered by its toxicity. This current technology delivers IL-12 only when and where it is needed - at the tumor site or site of infection.

INVENTOR(S)

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DEVELOPMENT STAGE

- Pre-clinical (in vivo)

PATENT STATUS

- **U.S. Issued:** US 8,556,882 (15 Oct. 2013)
- **Foreign Filed:** Canadian Patent Application No. 2,760,446 filed October 28, 2011
- **Foreign Filed:** EP Application # 10717361.9 (31 Oct. 2011)

THERAPEUTIC AREA

- Cancer/Neoplasm